# In-Silico Approach to Analyze Anticancer Activity of *Withania somnifera in* Oral Cancer

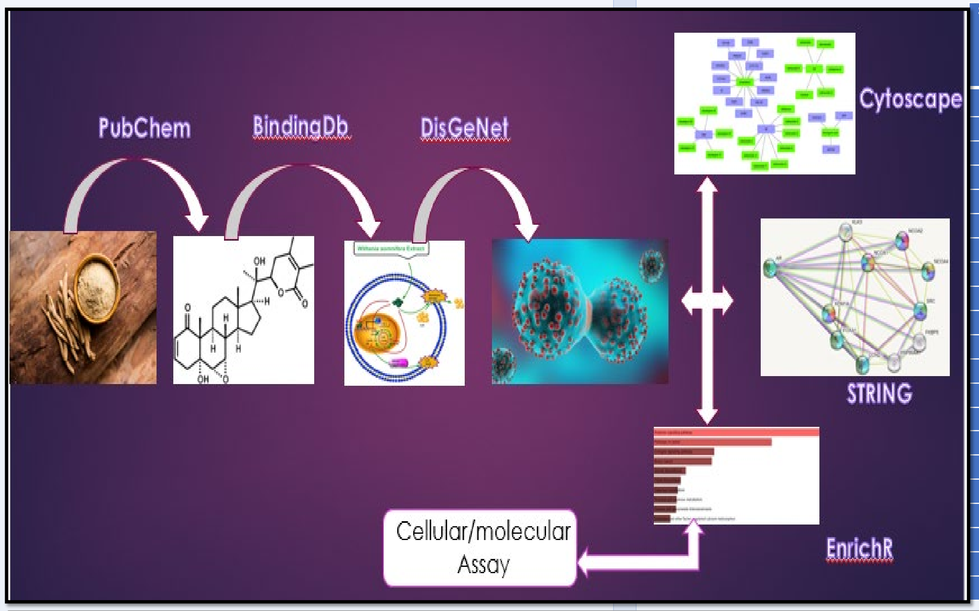

Gauri Kumbhar, Vaibhav Ladke, Supriya Kheur

Department of Oral Pathology & Microbiology, Dr. D.Y. Patil dental college and hospital, Pimpri, Pune.


## INTRODUCTION

Oral cancer is the 8th most common cancers worldwide. Surgery, radiotherapy, and chemotherapy are the main modalities of treatment for cancer. Alternative systems of medicine such as Ayurveda and Homeopathy have considerable potential in effectively supporting the management of cancer at various levels. During the last few decades, various plants, their extracts have been studied as chemo-preventive and chemotherapeutic compounds against various types of cancer. The present work aims to elucidate the anti-cancer activity of *Withania somnifera* using in silico approach. Further, the validation of bioactive needs to be carried out by cell-based *in vitro* assays [MTT assay] on the Oral Cancer cell line.

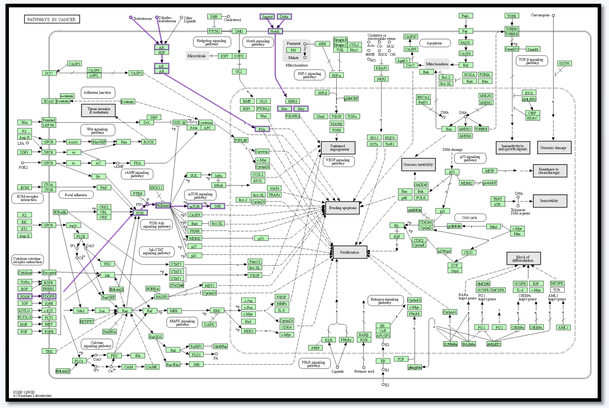
## MATERIALS AND METHODS




| SR.NO. | BIOAVTIVE COMPONENTS OF Withania somnifera |
|---|---|
| 1. | withanolide |
| 2. | withanolide A |
| 3. | withanone |
| 4. | withaferine A |
| 5. | withanolide D |
| 6. | withanolide E |
| 7. | withanolide M |
| 8. | withanolide N |
| 9. | withanolide O |
| 10. | withanolide R |
| 11. | withanolide P |
| 12. | withanolide Q |
| 13. | chlorogenic acid |
| 14. | β-sitosterol |
| 15. | sitoindoside i |
| 16. | tropanol |
| 17. | calystegine A3 |
| 18. | calystegine A5 |
| 19. | calystegine B1 |
| 20. | calystegine B2 |
| 21. | calystegine C1 |

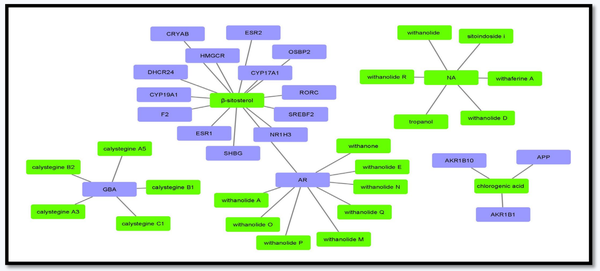
## RESULT

### KEGG PATHWAY OF CANCER

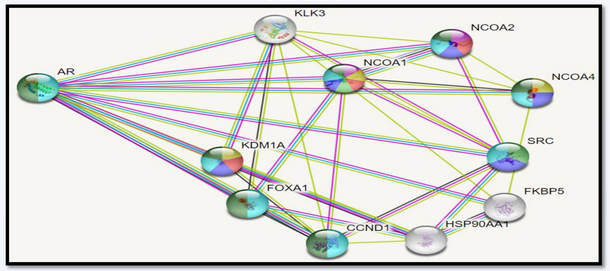


## RESULT

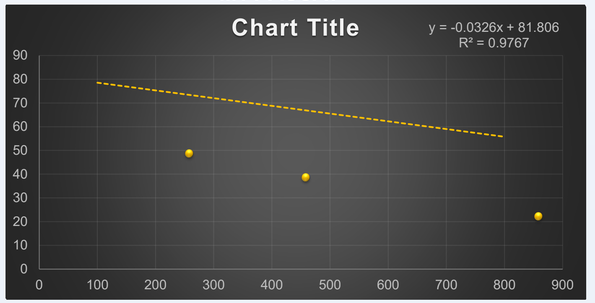
### NETWORK CONSTRUCTION




### STRING

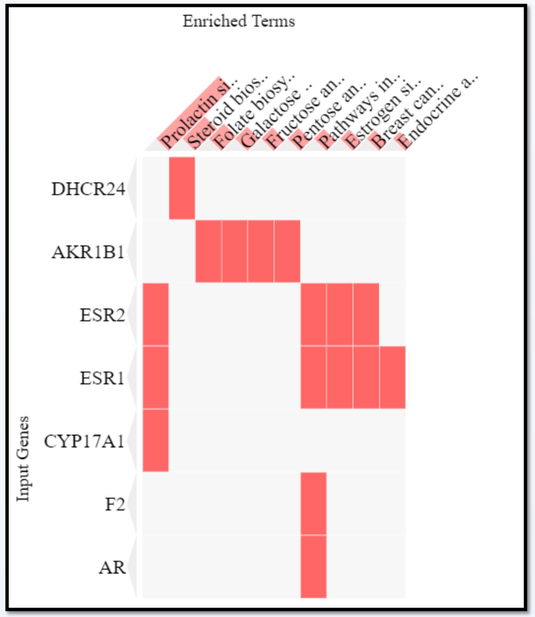



### MTT ASSAY

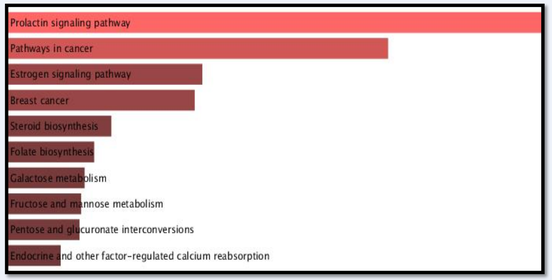



## RESULT

### ENRICH R CLUSTER GRAPH




### ENRICH R BAR GRAPH




## CONCLUSION

Network pharmacology approach augments to understand systems biology, network analysis, connectivity, redundancy, and pleiotropy. Hence this will help in understanding interactions of *Withania somnifera* bioactives with different targets and their association with different diseases and finally complex interrelation of all components in the network.

With the help of other Bioinformatic tools the desired genes and their involvement in many pathways can be predicated and can be used for further validation with various cellular and molecular assays along with proteomics.

## REFERENCES


Bray, F., Ferlay, J., Soerjomataram, I., Siegel, R.L., Torre, L.A. and Jemal, A. (2018), Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: A Cancer J for Clin, 68: 394-424. .

S.B. Mekbib, T.J.C. Regnier, D. Sivakumar, L. Korsten, Evaluation of ethiopian plant extracts, acacia seyal and *Withania somnifera* , to control green mould and ensure quality maintenance of citrus ( *Citrus sinensis* L.) , Fruits. 64 (2009) 285-294.